



DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

Low Carbon Cements and Concretes Consortium

AGENCY: National Institute of Standards and Technology, Department of Commerce.

ACTION: Notice of Research Consortium.

SUMMARY: The National Institute of Standards and Technology (NIST), an agency of the United States Department of Commerce, in support of efforts to develop standards for low carbon construction materials, is establishing the Low Carbon Cements and Concretes Consortium (“Consortium”). The Consortium will bring together stakeholders to identify and address measurement and standards needs related to low carbon cements and concretes used to reduce the overall greenhouse gas emissions from cement and concrete products. The Consortium efforts are intended to develop measurement solutions and standards to improve measurement confidence, establish measurement traceability, and enable comparability in the measurements to quantify carbon and carbonate in low carbon cements and concretes. Participants will be required to sign a Cooperative Research and Development Agreement (CRADA).

DATES: The Consortium's activities will commence on June 1, 2022 (“Commencement Date”). NIST will accept letters of interest to participate in this Consortium on an ongoing basis.

ADDRESSES: Completed letters of interest or requests for additional information about the Consortium can be directed via mail to the Consortium Manager, Dr. Pamela Chu, Chemical Sciences Division of NIST's Material Measurement Laboratory, 100 Bureau Drive, Mail Stop 8320, Gaithersburg, Maryland 20899, or via electronic mail to lowcarbonconcrete@nist.gov, or by telephone at (301) 975-2988.

FOR FURTHER INFORMATION CONTACT: J'aime Maynard, CRADA Administrator, National Institute of Standards and Technology's Technology Partnerships Office, by mail to 100 Bureau Drive, Mail Stop 2200, Gaithersburg, Maryland 20899, by electronic mail to Jaime.maynard@nist.gov, or by telephone at (301) 975-8408.

SUPPLEMENTARY INFORMATION: Cement is one of the most widely used materials and a critical component of roads, bridges, and buildings. Cement manufacturing is also a major contributor to carbon dioxide (CO₂) emissions through both energy use and calcination reactions. To help meet net zero climate goals, industry is developing a variety of techniques to reduce the net amount of CO₂ emitted from cement and concrete manufacturing. For example, one approach is to change the composition of the cement to reduce the total manufacturing process emissions. Another approach is to take advantage of carbonation, the uptake of CO₂, by curing concrete under a CO₂ atmosphere or injecting CO₂ during the mixing process.

The initial focus of this consortium is to evaluate, develop, and standardize methods to characterize and quantify the carbon and carbonates in new low carbon cements and concretes. Test methods to specifically measure carbon in these materials will be explored. A later focus of the consortium will be to evaluate the suitability of current measurement standards to measure the material, mechanical, structural, and durability properties and, where appropriate, develop new test methods needed to help enable acceptance of new low carbon cements and concretes in the marketplace. NIST and industrial partners will perform research together with the following four goals:

- Evaluate the suitability of current ASTM standards to measure carbon, including specifically measuring carbon in cements, concretes, and the associated starting materials such as aggregates.
- Accurately measure the amount of carbon uptake by a material during CO₂-curing processes. Validate the robustness and repeatability of the measurement method.

- Use these measurements as a foundation to propose tests(s) that can be standardized through the ASTM consensus process.
- Evaluate the applicability of current material, mechanical, structural, and durability tests used for cements and concretes to new low carbon cements and concretes. If needed, develop new tests or point out why old tests are not needed to help enable acceptance of these new materials in the marketplace.

No proprietary information will be shared as part of the Consortium. Participants will not be required to contribute any funds or pay any fee. Contributions of sample low carbon cements, concretes, and associated aggregates are highly encouraged.

Participation Process:

Eligibility will be determined by NIST based on the information provided by prospective participants in response to this notice. NIST will evaluate the submitted responses from prospective participants to determine eligibility to participate in this Consortium. Prospective participants should provide a letter of interest with the following information to NIST's

Consortium Manager:

- (1) A description of their experience in low carbon cements and concretes, production and characterization of cements, concretes, and associated starting materials such as aggregates, standard methods to evaluate cements and concretes, and related expertise to contribute to the Consortium.
- (2) List of interested party's anticipated participants.

Letters of interest must not include business proprietary information. NIST will not treat any information provided in response to this notice as proprietary information. NIST will notify each organization of its eligibility. In order to participate in this Consortium, each eligible organization must sign a CRADA for this Consortium. All participants in this Consortium will be bound by the same terms and conditions. NIST does not guarantee participation in the Consortium to any organization submitting a letter of interest.

Authority: 15 U.S.C. 3710a.

Alicia Chambers,

NIST Executive Secretariat.

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